Cutting-edge cameras reveal the secret life of dolphins

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A wild dusky dolphin off the coast of New Zealand with a new non-invasive underwater camera attached. Credit: The University of Sydney

A world-first study testing new underwater cameras on wild dolphins has given researchers the best view yet into their hidden marine world.

A research team including experts from the University of Sydney's Charles Perkins Centre and the University of Alaska Southeast trialled the custom-made non-invasive cameras to capture and analyse more than 535 minutes of such rarely-seen activities as mother-calf interaction, playing with kelp, and intimate social behaviours like flipper-rubbing. The results are published in the latest *Marine Biology*.

"For the first time, these cameras have given us the opportunity to see what dolphins do on their own terms," said Dr Gabriel Machovsky-Capuska from the University of Sydney's School of Veterinary Science and Charles Perkins Centre.

"There were no wildlife crews, no invasive underwater housings - and the dolphins remained largely unaffected by our cameras. This research opens up a whole new approach for capturing wild animal behaviour, which will ultimately help us to not only advance conservation efforts but also come closer to understanding wild predators' and human nutrition too."

The successful deployment advances new approaches to filming wild sea creatures, aiding conservation and rehabilitation efforts and giving researchers unprecedented insight into wild dolphins' prey and habitats.

"Dolphins are marine top predators that are considered biomonitors of marine environments, so gaining a better understanding of their lives will help us to better comprehend the health of marine environments including prey species like fish and squid that are highly consumed by humans," said Dr Machovsky-Capuska, who is also co-leader of the Human-Animal Interactions research node at the Charles Perkin Centre.

The cameras were attached via suction cups to eight wild dusky dolphins, deployed using a long pole with the aid of Velcro pads. The footage was captured off the coast of New Zealand from December

2015 to January 2016, with each camera system loaded with memory boards, very high frequency and satellite transmitters, time depth recorders and having a battery life of six hours.

"One challenge of doing this research on small and fast animals like dusky dolphins is that there is limited surface area on the dolphin's body for tag attachment, so there's only a small window of time to actually deploy the tag as the dolphin swims past," said Dr Peter Jones from the University of Sydney's School of Electrical and Information Engineering.

"We have much to learn about animal behaviour and systems such as this are a great way to observe their activity in a natural environment with the least likely influence on that behaviour."

Dolphin specialist Heidi Pearson, Assistant Professor of Marine Biology at the University of Alaska Southeast, said the research has great potential for protecting endangered species by giving scientists a much higher resolution of information than is possible than with other methods.

"From the surface, researchers can only see about 10 percent of what is going on in an animal's life. With these video cameras, we can 'see' from the animals' perspective and begin to understand the challenges they face as they move throughout their habitat," she said.

"For example, in marine areas subjected to high degrees of human disturbance such as shipping or coastal development, the ability to collect data from the animal's perspective will be critical in understanding how and to what extent these stressors affect an animal's ability to feed, mate, and raise young."

The researchers now hope to further develop the cameras to test with

marine predators including other cetacean species and sharks.

More information: Heidi C. Pearson et al, Testing and deployment of C-VISS (cetacean-borne video camera and integrated sensor system) on wild dolphins, *Marine Biology* (2017). DOI: 10.1007/s00227-017-3079-z

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